

CLAIMS

1. A patterned resistor on a substrate, comprising:
- 5 two conductive end terminations on the substrate;
- a pattern of first resistive material having a first width and a first
sheet resistance, applied on the substrate between the two conductive end
terminations; and
- a pattern of second resistive material having a second width and
a second sheet resistance, at least partially overlying the pattern of first
10 resistive material and extending between the two conductive end terminations,
 wherein one of the patterns of first and second resistive
materials extends onto the two conductive end terminations, and wherein one
of the first and second sheet resistances is a low sheet resistance and the
other of the first and second sheet resistances is a high sheet resistance, and
15 wherein a ratio of the high sheet resistance to the low sheet resistance is at
least ten to one, and wherein the one of the patterns of first and second
resistive materials that has the high sheet resistance is substantially wider than
the other of the patterns of first and second resistive material.
- 20 2. The patterned resistor according to claim 1, wherein the one of the
patterns of first and second resistive materials that has the high sheet
resistance is at least 50% wider than the other of the patterns of first and
second resistive material.
- 25 3. The patterned resistor according to claim 1, wherein the one of the
patterns of first and second resistive materials that has the high sheet
resistance is at least 50 microns wider than the other of the patterns of first and
second resistive material.
- 30 4. The patterned resistor according to claim 1, wherein the one of the
patterns of first and second resistive materials that extends onto the two
conductive end terminations is the pattern that has a low sheet resistance.

5. The patterned resistor according to claim 1, wherein a fine tuning trim kerf extends solely into the one of the patterns of first and second resistive materials that has a high sheet resistance.

- 5 6. The patterned resistor according to claim 5, wherein a coarse tuning trim kerf extends into the one of the patterns of first and second resistive materials that has the low sheet resistance.

7. A method for fabricating a patterned resistor on a substrate, comprising:

5 patterning two conductive end terminations on the substrate;
 patterning a first layer of resistive material having a first sheet
resistance to have a first width and to extend on the substrate between the two
conductive end terminations;

 patterning a second layer of resistive material having a second
sheet resistance to have a second width, to extend between the two
conductive end terminations, and to at least partially overlay the first layer of
10 resistive material; and

 patterning one of the first and second layers of resistive material
to extend onto the two conductive end terminations, wherein one of the first
and second sheet resistances is a low sheet resistance and the other of the
first and second resistances is a high sheet resistance, and wherein a ratio of
15 the high sheet resistance to the low sheet resistance is at least ten to one, and
wherein the one of the patterns of first and second resistive materials that has
the high sheet resistance is substantially wider than the other of the patterns of
first and second resistive material.

20 8. The patterned resistor according to claim 7, wherein the one of the
patterns of first and second resistive materials that has the high sheet
resistance is at least 50% wider than the other of the patterns of first and
second resistive material.

25 9. The patterned resistor according to claim 7, wherein the one of the
patterns of first and second resistive materials that has the high sheet
resistance is at least 50 microns wider than the other of the patterns of first and
second resistive material.

30 10. The method according to claim 7, further comprising:
 applying the first layer of resistive material by one of screen printing,
stenciling, direct writing, and foil lamination; and
 applying the second layer of resistive material by one of screen printing,
stenciling, direct writing, and foil lamination.

11. The method according to claim 7, wherein the patterning of the one of the first and second layers of resistive materials to extend onto the two conductive end terminations, comprises patterning the one of the first and second layers of resistive materials that has a low sheet resistance to extend
5 onto the two conductive end terminations.

12. The method according to claim 7, further comprising fine tuning the patterned resistor using a fine trim kerf that is extended solely into the one of
10 the first and second layers of resistive materials that has a high sheet resistance.

13. The method according to claim 12, further comprising coarse tuning the patterned resistor using a coarse trim kerf that is extended into the one of
15 the first and second layers of resistive materials that has a low sheet resistance.

14. The method according to claim 13, further comprising:
determining positions of edges of the patterned first and second
20 layers of resistive materials;
using the positions of the edges to determine a large offset side of the patterned resistor that has a larger separation between the edges of the patterned first and second layers of resistive materials; and
starting the fine trim kerf at the large offset side of the patterned
25 resistor.

15. The method according to claim 14, wherein the coarse trim kerf is cut before the fine trim kerf is cut, and wherein the determining of the larger offset side of the patterned resistor comprises:
30 measuring increments of the resistance change of the patterned resistor during the coarse trim kerf cut; and
determining the larger offset side from locations of substantial changes of the increments.

16. An electronic device comprises:

a substrate; and

a patterned resistor on the substrate, comprising:

two conductive end terminations on the substrate;

5 a pattern of first resistive material having a first width and
a first sheet resistance, applied on the substrate between the two conductive
end terminations; and

a pattern of second resistive material having a second
width and a second sheet resistance, at least partially overlying the pattern of
10 first resistive material and extending between the two conductive end
terminations,

wherein one of the patterns of first and second resistive material
extends onto the two conductive end terminations, and wherein one of the first
and second sheet resistances is a low sheet resistance and the other of the
15 first and second sheet resistances is a high sheet resistance, and wherein a
ratio of the high sheet resistance to the low sheet resistance is at least ten to
one, and wherein the one of the patterns of first and second resistive materials
that has the high sheet resistance is substantially wider than the other of the
patterns of first and second resistive material.

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17. The patterned resistor according to claim 16, wherein the one of the
patterns of first and second resistive materials that has the high sheet
resistance is at least 50% wider than the other of the patterns of first and
second resistive material.

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18. The patterned resistor according to claim 16, wherein the one of the
patterns of first and second resistive materials that has the high sheet
resistance is at least 50 microns wider than the other of the patterns of first and
second resistive material.

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